REMARKS

Claims 13-28 are all the claims presently pending in the application. Claims 13-14 are independent.

Applicant gratefully acknowledges that a combination of claim 13 and 23-24 and claims 14 and 26-27 may be allowable. However, Applicant respectfully submits that all of the claims are allowable.

Applicant also notes that, notwithstanding any claim amendments herein or later during prosecution, Applicant's intent is to encompass equivalents of all claim elements.

Claims 13, 15, 17-18, 23, and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Anzaki, et al. reference (U.S. Patent No. 6,316,110 B1). Claims 16 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Anzaki, et al. reference in view of the Okamura, et al reference (U.S. Patent No. 6,104,530). Claims 14, 19, 21-22, 26, and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Anzaki, et al. reference, in view of the Noreika, et al. reference (U.S. Patent No. 3,915,764) and either the Nulman reference (U.S. Patent No. 5,754,297) or the Shiroishi, et al reference (U.S. Patent No. 4,833,020). Claims 20 and 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Anzaki, et al. reference, in view of the Noreika, et al. reference and either the Nulman reference or Shiroishi, et al. reference and in further view of the Okamura, et al. reference. Claims 13, 15-18, and 23-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Okamura, et al. reference, in view of the Kenzo, et al. reference (JP 09-176837A). Claims 14, 19-22, and 26-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Okamura, et al. reference, in view of the Kenzo, et al. reference, and in further view of the Noreika, et al. reference and either the Nulman reference

or the Shiroishi, et al. reference.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention is directed to a method for producing a transparent laminate. The method includes preparing a transparent substrate, depositing a high-refractive-index transparent thin film by a vacuum dry process, depositing a silver transparent conductive thin film by a vacuum dry process, repeating the depositing of the high-refractive-index transparent thin film and the silver transparent conductive thin film at least three times to thereby form at least three combination thin-film layers of the high-refractive-index transparent thin film and the silver transparent conductive thin film successively laminated on a surface of said transparent substrate, and depositing another high-refractive-index transparent thin film on a surface of the combination thin-film layer by the vacuum dry process. The temperature T (K) of the transparent substrate at the time of the deposition of the silver transparent conductive thin films is set to be in a range $340 \leq T \leq 390$.

Plasma display panels include a fluorescent material which fluoresces in response to an electric discharge. However, in this process, electromagnetic waves and near-infrared rays are also emitted. These electromagnetic waves and near-infrared rays can cause interference with other devices.

Conventional transparent laminates have included metal thin films to reduce electromagnetic waves and near-infrared rays. Additionally, the metal thin films can also prevent reflection of visible rays. However, these transparent laminates have not been useful as a plasma display panel filter because the visible light transmitting properties are not

adequate. For example, the conventional transparent laminates could not be set with a neutral gray color tone. In particular, these conventional transparent laminates do not have constant transmittance over the entire visible light range.

By contrast, the present invention provides a transparent laminate which is capable of being used with a plasma display panel because visible light transmitting properties and visible light low-reflection properties are satisfactory. As a result, the transparent laminate may be used with a plasma display panel to act as a shield for electromagnetic waves and near-infrared rays.

The present inventors discovered a method of producing such a transparent laminate by controlling the temperature of the substrate and the deposition rate of the silver transparent conductive thin films which provides light absorption characteristics which are unexpected. In particular, the present inventors discovered that a transparent laminate can be produced which is useful for a plasma display panel by maintaining the temperature T (K) of the transparent substrate at the time of the deposition of the silver transparent conductive thin films in a range of $340 \leq T \leq 390$.

This method provides a transparent laminate having a reduced wavelength dependence of visible light transmittance so that the laminate can exhibit the color tone of neutral gray without the addition of any absorbent such as a dye. The laminate also has transmittance which is high enough over the entire visible light range and can satisfy all the properties such as electromagnetic wave shielding, near-infrared cutting, visible light low-reflectance, etc. as required of a PDP film in spite of the simple structure. Moreover, the invention provides a light-weight thin PDP filter of good visibility.

II. THE PRIOR ART REJECTIONS

A. The Anzaki et al. reference

Regarding the rejection of claims 13, 15, 17-18, 23, and 25, the Examiner alleges that it would have been obvious to modify the Anzaki et al. reference to form the claimed invention. Applicant submits, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

As admitted by the Examiner, the Anzaki et al. reference does not teach or suggest the features of the claimed invention including depositing a silver transparent conductive thin film when a temperature of the transparent substrate at the time of deposition is within a range of $340 \leq T \leq 390$.

Rather, as pointed out by Examiner Markham, the Anzaki et al. reference teaches heating the substrate to a temperature of 573K or lower during the silver film formation. While the ranges disclosed in the applied references overlap the claimed range, the Anzaki et al. reference does not teach or suggest the criticality of the claimed temperature ranges. Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range (M.P.E.P. 2144.05(III)).

The specification of the present application explains the problems associated with having the substrate temperature too high or too low. "Generally, when the temperature of the substrate is high, aggregation is apt to occur in the inside of the thin film. As a result, each of islands is shaped like a sphere, so that it is difficult to form a continuous structure even in the case where the thickness of the thin film is relatively large." (page 5, lines 13-18 emphasis added). This can cause abnormal light absorption called surface plasma resonance

absorption, and in the case of a silver transparent conductive thin film, the electromagnetic wave shielding function cannot be fulfilled sufficiently because electric resistance in the direction of width of the film is remarkably reduced as well as visible light transmittance in a certain wave range. (page 5, line 23 - page 6, line 8). When the deposition rate is high, the thin film may easily be formed as a continuous structure. However, when this deposition rate is heightened, dependence on transmittance of wavelengths is so large that the transparent laminate cannot exhibit the color tone of neutral gray thought visible light transmittance is improved overall. (page 5, line 18 - page 6, line 13).

The specification explains that the inventors discovered that, when the temperature of the substrate and the deposition rate of the silver transparent are controlled within the claimed ranges, delicate light absorption different from the aforementioned general surface plasma resonance absorption occurs. As a result, wavelength dependence of visible light transmittance is reduced so that the transparent laminate can exhibit the color tone of neutral gray without addition of any absorbent such as a dye into the transparent substrate. (page 6, line 14 - page 7, line 4).

Moreover, the specification explains that transparent laminate produced as recited in claims 13 and 14 has transmittance kept sufficiently high with respect to the whole visible light range and can satisfy all properties such as electromagnetic wave shielding property, near-infrared cutting property, visible light low-reflecting property, etc. required of a PDP film in spite of the simple structure of the claimed transparent laminate. (page 7, lines 5-11). The specification also explains that the inventors found that a light-weight thin PDP filter of good visibility having the aforementioned properties can be obtained using the claimed transparent laminate. (page 7, lines 11-14).

The specification also explains that with the use of the claimed invention is significant in achieving a more delicate light absorption as compared with the light absorption of a conventional silver transparent conductive thin film. (page 17, lines 18-23). The specification explains the problems associated with having a temperature which is too high or too low (page 17, line 23 - page 18, line 24).

Additionally, the specification sets forth specific results of sample produced at temperatures below (333K for sample 5 and 303K for sample 6) and above (413K for both samples 7 and 8) the claimed ranges showing the unsuitability of the samples which were produced outside of the claimed ranges and, thus, the criticality of these ranges. (page 25, line 12 - page 33, line 7). Applicants respectfully submit that the specification sets forth adequate evidence of the criticality of the claimed ranges and that this criticality is not taught or suggested in the applied reference.

Further, Applicant submits that the Examiner can point to no motivation or suggestion in the references to modify the Anzaki et al. reference as alleged by the Examiner. Indeed, the Examiner does not even support the combination by identifying a reason for modifying the Anzaki et al. reference. Rather, the Examiner merely makes a conclusory allegation that "it would have been obvious to one of ordinary skill in the art to have selected the portion of the Anzaki et al.'s temperature range that corresponds to the applicant's claimed range." The Examiner makes this allegation without providing any teaching or suggestion for making such a modification.

Therefore, the Examiner is respectfully requested to withdraw this rejection of claims 13, 15, 17-18, 23, and 25.

B. The Anzaki et al. reference in view of the Okamura et al. reference

Regarding the rejection of claims 16 and 24, the Examiner alleges that the Okamura et al. reference would have been combined with the Anzaki et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

Specifically, the Anzaki et al. reference is directed to providing a laminate which shields against electromagnetic waves and near infrared rays, has high visible light transmission and sufficient durability by dividing a metal layer containing silver into three layers and adding a prescribed amount of palladium.

In contrast, the Okamura et al. reference is specifically directed to providing a transparent laminate having high transparency, excellent electromagnetic shielding characteristics and near-infrared blocking characteristics by laminating high-refractive-index transparent film and metal film layers and repeatedly laminating three times or more.

Indeed, the <u>laminate disclosed by the Anzaki et al. reference is an improvement over the laminate disclosed by the Okamura et al. reference</u>. Thus, one of ordinary skill in the art would not have been motivated to modify the Anzaki et al. reference based on the disclosure of the Okamura et al. reference. Therefore, the references would <u>not</u> have been combined, <u>absent hindsight</u>.

Further, Applicant submits that the Examiner can point to no motivation or suggestion

in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner does not even support the combination by identifying a reason for combining the references.

The Examiner alleges that one of ordinary skill in the art would have been motivated to modify the anti-reflection coating disclosed by the Anzaki et al. reference with the low-refractive index anti-reflection coating disclosed by the Okamura et al. reference because: 1) the Okamura et al. reference discloses that such low-refractive index anti-reflection coatings are "suitable;" and 2) to obtain "the benefits of using an antireflective film." However, Applicants respectfully submit that neither of these alleged "motivations" are a motivation to modify.

The mere teaching that a particular substitution of materials <u>is suitable does not motivate</u> one of ordinary skill in the art to modify anything <u>without some benefit to be obtained</u> by the modification. The Okamura et al. reference does not teach or suggest that a low-refractive index anti-reflection coating is <u>any better than any other ant-reflection coating</u>. Therefore, one or ordinary skill in the art at the time of the invention <u>would not have been motivated</u> to modify the teachings of the Anzaki et al. reference by substituting the anti-reflection coating with a low-refractive index coating disclosed in the Okamura et al. reference simply because <u>there is no benefit to be obtained</u> which is taught or suggested by either of these references.

Additionally, contrary to the Examiner's allegations, the Anzaki et al. reference does not teach or suggest applying a low-refractive index transparent thin film <u>before</u> any high-refractive index thin film. Rather, the Anzaki et al. reference teaches that an "antireflection surface treatment <u>may be applied to the surface</u> of the light transmitting electromagnetic wave shield film." (Col. 6, lines 29-32). In other words, the Anzaki et al. reference teaches

applying the antireflection thin film after the high-refractive index thin film.

The Okamura et al. reference does not remedy these deficiencies.

Therefore, the Examiner is respectfully requested to withdraw this rejection of claims 16 and 24.

C. The Anzaki et al. reference in view of the Noreika et al. reference and either the Nulman reference or the Shiroishi et al. reference

Regarding the rejection of claims 14, 19, 21-22, 26, and 28, the Examiner alleges that the Noreika et al. reference would have been combined with the Anzaki et al. reference and further that either the Nulman reference or the Shiroishi et al. reference would have been combined with the combination of the Anzaki et al. reference and the Noreika et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

As explained above, the Anzaki et al. reference is directed to providing a laminate which shields against electromagnetic waves and near infrared rays, has high visible light transmission and sufficient durability by dividing a metal layer containing silver into three layers and adding a prescribed amount of palladium.

In contrast, the Noreika et al. reference is specifically directed to an improvement the formation of thin doped layers of epitaxial gallium arsenide and other semiconductor

materials for use with microwave devices (col. 1, lines 10-12 and 21-22; and col. 2, lines 11-16). The doped semiconductor material layers which are deposited by the system disclosed by the Noreika et al. reference are not used in the transparent laminate disclosed by the Anzaki et al. reference. Therefore, one of ordinary skill in the art would not have been motivated to modify the transparent laminate disclosed by the Anzaki et al. reference with an improved method for forming thin doped layers of semiconductor materials as disclosed by the Noreika et al. reference because the Anzaki et al. reference simply does not teach or suggest a doped semiconductor material layer in the transparent laminate.

Indeed, to modify the method of producing a transparent laminate as disclosed by the Anzaki et al. reference to incorporate the method of forming a thin doped layer of semiconductor material as disclosed by the Noreika et al. reference would destroy the intended purpose of the transparent laminate of the Anzaki et al. reference because such a laminate would no longer be transparent.

Even assuming arguendo, that one of ordinary skill in the art would have combined the teachings of the Noreika et al. reference with the teachings of the Anzaki et al. reference, one of ordinary skill in the art would not have been motivated to further modify this combination with either of the teachings of the Nulman reference or the Shiroishi et al. reference.

In contrast to the Anzaki et al. reference and the Noreika et al. reference, the Nulman reference is directed to completely different matters and problems.

In particular, the Nulman reference is directed to improving a method of deposition for semiconductor devices which are especially complex and expensive (col. 1, lines 17-32) by providing a deposition rate monitor (col. 2, lines 12-17). Therefore, one of ordinary skill

in the art would not have been motivated to modify the method of producing a transparent laminate as disclosed by the Anzaki et al. reference with an improved method of deposition for semiconductor devices as disclosed by the Nulman reference because the transparent laminate disclosed by the Anzaki et al. reference does not include semiconductor devices.

Indeed, to modify method of producing a transparent laminate as disclosed by the Anzaki et al. reference to incorporate the method of deposition for semiconductor devices as disclosed by the Nulman reference would destroy the intended purpose of the transparent laminate of the Anzaki et al. reference because such a laminate would no longer be transparent.

Therefore, one of ordinary skill in the art would not have been motivated to combine the teachings of the Nulman reference with the alleged combination of the Anzaki et al. reference and the Noreika et al. reference.

Further, the Shiroishi et al. reference is directed to providing a magnetic recording medium which is capable of reading and writing with a high recording density and having a high signal to noise ratio but less modulation. One of ordinary skill in the art would not have been motivated to modify the transparent laminate disclosed by the Anzaki et al. reference with the magnetic recording medium disclosed by the Shiroishi et al. reference because the transparent laminate has absolutely nothing to do with magnetic recording media.

Indeed, such a combination as alleged by the Examiner would destroy the intended purpose of the Anzaki et al. reference. Any modification to the transparent laminate disclosed by the Anzaki et al. reference to include and/or to transform the laminate into a magnetic recording medium would destroy the intended purpose of the Anzaki et al. reference of providing an improved transparent laminate.

Thus, the references would not have been combined, absent hindsight.

Further, Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner does not even support the combination by identifying a reason for combining the references.

As admitted by the Examiner, the Anzaki et al. reference does not teach or suggest the features of the claimed invention including depositing a silver transparent conductive thin film when a temperature of the transparent substrate at the time of deposition is within a range of $340 \leq T \leq 390$.

Rather, as pointed out by Examiner Markham, the Anzaki et al. reference teaches heating the substrate to a temperature of 573K or lower during the silver film formation. While the ranges disclosed in the applied references overlap the claimed range, the the Anzaki et al. reference does not teach or suggest the criticality of the claimed temperature ranges. Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range (M.P.E.P. 2144.05(III)).

The specification of the present application explains the problems associated with having the substrate temperature too high or too low. "Generally, when the temperature of the substrate is high, aggregation is apt to occur in the inside of the thin film. As a result, each of islands is shaped like a sphere, so that it is difficult to form a continuous structure even in the case where the thickness of the thin film is relatively large." (page 5, lines 13-18 emphasis added). This can cause abnormal light absorption called surface plasma resonance absorption, and in the case of a silver transparent conductive thin film, the electromagnetic wave shielding function cannot be fulfilled sufficiently because electric resistance in the direction of width of the film is remarkably reduced as well as visible light transmittance in a

certain wave range. (page 5, line 23 - page 6, line 8). When the deposition rate is high, the thin film may easily be formed as a continuous structure. However, when this deposition rate is heightened, dependence on transmittance of wavelengths is so large that the transparent laminate cannot exhibit the color tone of neutral gray thought visible light transmittance is improved overall. (page 5, line 18 - page 6, line 13).

The specification explains that the inventors discovered that, when the temperature of the substrate and the deposition rate of the silver transparent are controlled within the claimed ranges, delicate light absorption different from the aforementioned general surface plasma resonance absorption occurs. As a result, wavelength dependence of visible light transmittance is reduced so that the transparent laminate can exhibit the color tone of neutral gray without addition of any absorbent such as a dye into the transparent substrate. (page 6, line 14 - page 7, line 4). Moreover, the specification explains that transparent laminate produced as recited in claims 13 and 14 has transmittance kept sufficiently high with respect to the whole visible light range and can satisfy all properties such as electromagnetic wave shielding property, near-infrared cutting property, visible light low-reflecting property, etc. required of a PDP film in spite of the simple structure of the claimed transparent laminate. (page 7, lines 5-11). The specification also explains that the inventors found that a light-weight thin PDP filter of good visibility having the aforementioned properties can be obtained using the claimed transparent laminate. (page 7, lines 11-14).

The specification also explains that with the use of the claimed invention is significant in achieving a more delicate light absorption as compared with the light absorption of a conventional silver transparent conductive thin film. (page 17, lines 18-23). The specification explains the problems associated with having a temperature which is too high or too low (page 17, line 23 - page 18, line 24). Additionally, the specification sets forth specific results of sample produced at temperatures below (333K for sample 5 and 303K for

sample 6) and above (413K for both samples 7 and 8) the claimed ranges showing the unsuitability of the samples which were produced outside of the claimed ranges and, thus, the criticality of these ranges. (page 25, line 12 - page 33, line 7). Applicants respectfully submit that the specification sets forth adequate evidence of the criticality of the claimed ranges and that this criticality is not taught or suggested in the applied reference.

While the Examiner alleges that a combination of these references discloses that the deposition rate is a result/effective variable and, as a result, alleges that the discovery of an optimum value is considered within the skill of one of skill in the art, the result for which the alleged combination is effective is not the result achieved by the present invention.

As explained in the present specification at, for example page 5, line 18 - page 7, line 15, the inventors control the deposition rate to avoid the creation of islands which are shaped like spheres (because of a low deposition rate) which would make it difficult to form a continuous structure and which, in turn, would adversely affect light absorption because surface plasma resonance would occur and to minimize the dependence of transmittance on wavelengths (because of a high deposition rate) so that the transparent laminate can exhibit the color tone of neutral gray. In other words, the result which is desired by the present invention is to avoid the creation of islands which are spherically shaped and to reduce the dependence of transmittance on wavelengths.

By contrast, the Anzaki et al. reference teaches that the result which is achieved by controlling the thickness of the silver film is adequate electromagnetic wave shielding and near infrared ray shielding properties. Therefore, even assuming that such a combination of references might have been made by one of ordinary skill in the art, such a combination would not provide the results which are achieved by present invention.

Therefore, the Examiner is respectfully requested to withdraw this rejection of claims 14, 19, 21-22, 26, and 28.

D. The Anzaki et al. reference in view of the Noreika et al. reference and either the Nulman reference or the Shiroishi et al. reference and in further view of the Okamura et al. reference

Regarding the rejection of claims 20 and 27, the Examiner alleges that the Noreika et al. reference would have been combined with the Anzaki et al. reference and further that either the Nulman reference or the Shiroishi et al. reference would have been combined with the combination of the Anzaki et al. reference and the Noreika et al. reference and that the Okamura et al. reference would have been combined with one of those combinations to form the claimed invention. Applicant submits, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

As explained above, none of the Anzaki et al. (2), the Noreika et al. and the Nulman or Shiroishi et al. references would have been combined because these references are directed to completely different matters and problems.

Further, the Okamura et al. reference is specifically directed to providing a transparent laminate having high transparency, excellent electromagnetic shielding characteristics and near-infrared blocking characteristics by laminating high-refractive-index transparent film

and metal film layers and repeatedly laminating three times or more. Thus, the references would not have been combined, absent hindsight.

Additionally, contrary to the Examiner's allegations, the Anzaki et al. reference does not teach or suggest applying a low-refractive index transparent thin film before any high-refractive index thin film. Rather, the Anzaki et al. reference teaches that an "antireflection surface treatment may be applied to the surface of the light transmitting electromagnetic wave shield film." (Col. 6, lines 29-32). In other words, the Anzaki et al. reference teaches applying the antireflection thin film after the high-refractive index thin film.

None of the other applied references remedy the deficiencies of the Anzaki et al. reference.

Therefore, the Examiner is respectfully requested to withdraw this rejection of claims 20 and 27.

E. The Okamura et al. reference in view of the Kenzo et al. reference

Regarding the rejection of claims 13, 15-18, and 23-25, the Examiner alleges that the Kenzo et al. reference would have been combined with the Okamura et al. reference to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicant submits that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

Specifically, the Okamura et al. reference is directed to providing a transparent

laminate having high transparency, excellent electromagnetic shielding characteristics and near-infrared blocking characteristics by laminating high-refractive-index transparent film and metal film layers and repeatedly laminating three times or more.

In contrast, the Kenzo et al. reference is specifically directed to improving a transparent electric conduction film by providing a transparent oxide, which consists of a mixed oxide of indium oxide, a cerium oxide, etc., rather than an ITO thin film or a IO thin film, to sandwich a silver containing layer. One of ordinary skill in the art would not have been motivated to modify the teachings of the Okamura et al. reference which is directed to laminating three or more repeated layers of transparent film and metal film layer by substituting a mixed oxide of indium oxide, a cerium oxide, etc. as disclosed by the Kenzo et al. reference for the high-refractive-index transparent film disclosed by the Kenzo et al. reference. Thus, the references would not have been combined, absent hindsight.

Further, Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner does not even support the combination by identifying a reason for combining the references.

The Examiner alleges that it would have been obvious to modify the teachings of the Okamura et al. reference with the teachings of the Kenzo et al. reference by performing the silver film deposition process at a temperature between room temperature and 180 degrees Celsius as disclosed by the Kenzo et al. reference because such a teaching provides a "reasonable expectation of success" for deposition of that silver film. However, Applicant respectfully submits one of ordinary skill in the art would not have been motivated as suggested by the Examiner,

Firstly, there is nothing to suggest in these references that the silver film is not

successfully deposited by the Okamura et al. reference. Therefore, there is no reason to modify the disclosure of the Okamura et al. reference to deposit the silver film in accordance with the teachings of the Kenzo et al. reference because there is nothing within either of these references which teaches or suggests that the deposition of the silver film as disclosed by the Okamura et al. reference is not successful.

Secondly, contrary to the Examiner's allegations, the Kenzo et al. reference does not teach deposition of the silver film at specific temperature to be successful at deposition. Rather, the Kenzo et al. reference discloses deposition of the silver film at specific temperatures "in order to secure etching fitness." Therefore, the Examiner's proposed motivation is clearly contrary to the teachings of the applied references.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention. As admitted by the Examiner, the applied references do not teach or suggest the features of the claimed invention including depositing a silver transparent conductive thin film when a temperature of the transparent substrate at the time of deposition is within a range of $340 \leq T \leq 390$.

Rather, as pointed out by Examiner Markham, the Kenzo et al. reference teaches depositing a silver layer at a substrate temperature of 180 degrees Celsius or less. While the range disclosed in the Kenzo et al. reference overlap the claimed range, the Kenzo et al. reference reference does not teach or suggest the criticality of the claimed temperature ranges. Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range (M.P.E.P. 2144.05(III)).

The specification of the present application explains the problems associated with

having the substrate temperature too high or too low. "Generally, when the temperature of the substrate is high, aggregation is apt to occur in the inside of the thin film. As a result, each of islands is shaped like a sphere, so that it is difficult to form a continuous structure even in the case where the thickness of the thin film is relatively large." (page 5, lines 13-18 emphasis added). This can cause abnormal light absorption called surface plasma resonance absorption, and in the case of a silver transparent conductive thin film, the electromagnetic wave shielding function cannot be fulfilled sufficiently because electric resistance in the direction of width of the film is remarkably reduced as well as visible light transmittance in a certain wave range. (page 5, line 23 - page 6, line 8). When the deposition rate is high, the thin film may easily be formed as a continuous structure. However, when this deposition rate is heightened, dependence on transmittance of wavelengths is so large that the transparent laminate cannot exhibit the color tone of neutral gray thought visible light transmittance is improved overall. (page 5, line 18 - page 6, line 13).

The specification explains that the inventors discovered that, when the temperature of the substrate and the deposition rate of the silver transparent are controlled within the claimed ranges, delicate light absorption different from the aforementioned general surface plasma resonance absorption occurs. As a result, wavelength dependence of visible light transmittance is reduced so that the transparent laminate can exhibit the color tone of neutral gray without addition of any absorbent such as a dye into the transparent substrate. (page 6, line 14 - page 7, line 4). Moreover, the specification explains that transparent laminate produced as recited in claims 13 and 14 has transmittance kept sufficiently high with respect to the whole visible light range and can satisfy all properties such as electromagnetic wave shielding property, near-infrared cutting property, visible light low-reflecting property, etc.

required of a PDP film in spite of the simple structure of the claimed transparent laminate. (page 7, lines 5-11). The specification also explains that the inventors found that a light-weight thin PDP filter of good visibility having the aforementioned properties can be obtained using the claimed transparent laminate. (page 7, lines 11-14).

The specification also explains that with the use of the claimed invention is significant in achieving a more delicate light absorption as compared with the light absorption of a conventional silver transparent conductive thin film. (page 17, lines 18-23). The specification explains the problems associated with having a temperature which is too high or too low (page 17, line 23 - page 18, line 24). Additionally, the specification sets forth specific results of sample produced at temperatures below (333k for sample 5 and 303 k for sample 6) and above (413K for both samples 7 and 8) the claimed ranges showing the unsuitability of the samples which were produced outside of the claimed ranges and, thus, the criticality of these ranges. (page 25, line 12 - page 33, line 7). Applicants respectfully submit that the specification sets forth adequate evidence of the criticality of the claimed ranges and that this criticality is not taught or suggested in the applied reference.

Therefore, the Examiner is respectfully requested to withdraw this rejection of claims 13, 15-18, and 23-25.

F. The Okamura et al. reference in view of the Kenzo et al. reference in further view of the Noreika et al. reference and either the Nulman reference or the Shiroishi et al. reference

Regarding the rejection of claims 14, 19-22, and 26-28, the Examiner alleges that the Kenzo et al. reference would have been combined with the Okamura et al. reference and that

the Noreika et al. reference would have been combined with the combination of the Okamura et al. and Kenzo et al. references and further that either the Nulman reference or the Shiroishi et al. reference would have been combined with the Okamura et al., Kenzo et al. and Noreika et al. references to form the claimed invention. Applicants submit, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicants submit that these references would not have been combined as alleged by the Examiner. Indeed, the references are directed to completely different matters and problems.

Specifically, the Okamura et al. reference is directed to providing a transparent laminate having high transparency, excellent electromagnetic shielding characteristics and near-infrared blocking characteristics by laminating high-refractive-index transparent film and metal film layers and repeatedly laminating three times or more.

In contrast, the Kenzo et al. reference is specifically directed to improving a transparent electric conduction film by providing a transparent oxide, which consists of a mixed oxide of indium oxide, a cerium oxide, etc., rather than an ITO thin film or a IO thin film, to sandwich a silver containing layer. One of ordinary skill in the art would not have been motivated to modify the teachings of the Okamura et al. reference which is directed to laminating three or more repeated layers of transparent film and metal film layer by substituting a mixed oxide of indium oxide, a cerium oxide, etc. as disclosed by the Kenzo et al. reference for the high-refractive-index transparent film disclosed by the Kenzo et al. reference. Thus, these references would not have been combined, absent hindsight.

Further, in contrast to the Okamura et al. and Kenzo et al. references, the Noreika et al. reference is specifically directed to an improvement the formation of thin doped layers of epitaxial gallium arsenide and other semiconductor materials for use with microwave devices

(col. 1, lines 10-12 and 21-22; and col. 2, lines 11-16). The doped semiconductor material layers which are deposited by the system disclosed by the Noreika et al. reference are not used in the transparent laminate disclosed by the Okamura et al. and Kenzo et al. references. Therefore, one of ordinary skill in the art would not have been motivated to modify the transparent laminate disclosed by the Okamura et al. and Kenzo et al. references with an improved method for forming thin doped layers of semiconductor materials as disclosed by the Noreika et al. reference because the Okamura et al. and Kenzo et al. references simply do not teach or suggest a doped semiconductor material layer in the transparent laminate.

Indeed, to modify method of producing a transparent laminate as disclosed by the Okamura et al. and Kenzo et al. references to incorporate the method of forming a thin doped layer of semiconductor material as disclosed by the Noreika et al. reference would destroy the intended purpose of the transparent laminate of the Okamura et al. and Kenzo et al. references because such a laminate would no longer be transparent.

Even assuming arguendo, that one of ordinary skill in the art would have combined the teachings of the Noreika et al. reference with the teachings of the Okamura et al. and Kenzo et al. references, one of ordinary skill in the art would not have been motivated to further modify this combination with either of the teachings of the Nulman reference or the Shiroishi et al. reference.

In contrast to the Okamura et al. and Kenzo et al. references and the Noreika et al. reference, the Nulman reference is directed to completely different matters and problems.

In particular, the Nulman reference is directed to improving a method of deposition for semiconductor devices which are especially complex and expensive (col. 1, lines 17-32) by providing a deposition rate monitor (col. 2, lines 12-17). Therefore, one of ordinary skill

in the art would not have been motivated to modify the method of producing a transparent laminate as disclosed by the Okamura et al. and Kenzo et al. references with an improved method of deposition for semiconductor devices as disclosed by the Nulman reference because the transparent laminate disclosed by the Okamura et al. and Kenzo et al. references does not include semiconductor devices.

Indeed, to modify method of producing a transparent laminate as disclosed by the Okamura et al. and Kenzo et al. references to incorporate the method of deposition for semiconductor devices as disclosed by the Nulman reference would destroy the intended purpose of the transparent laminate of the Okamura et al. and Kenzo et al. references because such a laminate would no longer be transparent.

Therefore, one of ordinary skill in the art would not have been motivated to combine the teachings of the Nulman reference with the alleged combination of the Okamura et al. and Kenzo et al. references and the Noreika et al. reference.

Further, the Shiroishi et al. reference is directed to providing a magnetic recording medium which is capable of reading and writing with a high recording density and having a high signal to noise ratio but less modulation. One of ordinary skill in the art would not have been motivated to modify the transparent laminate disclosed by the Okamura et al. and Kenzo et al. references with the magnetic recording medium disclosed by the Shiroishi et al. reference because the transparent laminate has absolutely nothing to do with magnetic recording media.

Indeed, such a combination as alleged by the Examiner would destroy the intended purpose of the Okamura et al. and Kenzo et al. references. Any modification to the transparent laminate disclosed by the Okamura et al. and Kenzo et al. references to include

and/or to transform the laminate into a magnetic recording medium would destroy the intended purposes of the Okamura et al. and Kenzo et al. references of providing an improved transparent laminate.

Thus, the references would not have been combined, absent hindsight.

Further, Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner. Indeed, the Examiner does not even support the combination by identifying a reason for combining the references.

While the Examiner alleges that a combination of these references discloses that the deposition rate is a result/effective variable and, as a result, alleges that the discovery of an optimum value is considered within the skill of one of skill in the art, the result for which the alleged combination is effective is not the result achieved by the present invention.

As explained in the present specification at, for example, page 5, line 18 - page 7, line 15, the inventors control the deposition rate to avoid the creation of islands which are shaped like spheres (because of a low deposition rate) which would make it difficult to form a continuous structure and which, in turn, would adversely affect light absorption because surface plasma resonance would occur and to minimize the dependence of transmittance on wavelengths (because of a high deposition rate) so that the transparent laminate can exhibit the color tone of neutral gray. In other words, the result which is desired by the present invention is to avoid the creation of islands which are spherically shaped and to reduce the dependence of transmittance on wavelengths.

By contrast, the Okamura et al. reference teaches that the result which is achieved by controlling the thickness of the silver film is electric conductivity and optical properties (col. 10, lines 36-37. The Okamura et al. reference specifically concentrates upon achieving

correct electrical conductivity and transparency (col. 10, lines 37-42). Therefore, even assuming that such a combination of references might have been made by one of ordinary skill in the art, such a combination would not provide the results which are achieved by present invention.

Even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention. As admitted by the Examiner, the applied references do not teach or suggest the features of the claimed invention including depositing a silver transparent conductive thin film when a temperature of the transparent substrate at the time of deposition is within a range of $340 \leq T \leq 390$.

Rather, as pointed out by Examiner Markham, the Kenzo et al. reference teaches depositing a silver layer at a substrate temperature of 180 degrees Celsius or less. While the range disclosed in the Kenzo et al. reference overlap the claimed range, the Kenzo et al. reference does not teach or suggest the criticality of the claimed temperature ranges. Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range (M.P.E.P. 2144.05(III)).

The specification of the present application explains the problems associated with having the substrate temperature too high or too low. "Generally, when the temperature of the substrate is high, aggregation is apt to occur in the inside of the thin film. As a result, each of islands is shaped like a sphere, so that it is difficult to form a continuous structure even in the case where the thickness of the thin film is relatively large." (page 5, lines 13-18 emphasis added). This can cause abnormal light absorption called surface plasma resonance absorption, and in the case of a silver transparent conductive thin film, the electromagnetic

wave shielding function cannot be fulfilled sufficiently because electric resistance in the direction of width of the film is remarkably reduced as well as visible light transmittance in a certain wave range. (page 5, line 23 - page 6, line 8). When the deposition rate is high, the thin film may easily be formed as a continuous structure. However, when this deposition rate is heightened, dependence on transmittance of wavelengths is so large that the transparent laminate cannot exhibit the color tone of neutral gray thought visible light transmittance is improved overall. (page 5, line 18 - page 6, line 13).

The specification explains that the inventors discovered that, when the temperature of the substrate and the deposition rate of the silver transparent are controlled within the claimed ranges, delicate light absorption different from the aforementioned general surface plasma resonance absorption occurs. As a result, wavelength dependence of visible light transmittance is reduced so that the transparent laminate can exhibit the color tone of neutral gray without addition of any absorbent such as a dye into the transparent substrate. (page 6, line 14 - page 7, line 4). Moreover, the specification explains that transparent laminate produced as recited in claims 13 and 14 has transmittance kept sufficiently high with respect to the whole visible light range and can satisfy all properties such as electromagnetic wave shielding property, near-infrared cutting property, visible light low-reflecting property, etc. required of a PDP film in spite of the simple structure of the claimed transparent laminate. (page 7, lines 5-11). The specification also explains that the inventors found that a light-weight thin PDP filter of good visibility having the aforementioned properties can be obtained using the claimed transparent laminate. (page 7, lines 11-14).

The specification also explains that with the use of the claimed invention is significant in achieving a more delicate light absorption as compared with the light absorption of a

conventional silver transparent conductive thin film. (page 17, lines 18-23). The specification explains the problems associated with having a temperature which is too high or too low (page 17, line 23 - page 18, line 24). Additionally, the specification sets forth specific results of sample produced at temperatures below (333K for sample 5 and 303K for sample 6) and above (413K for both samples 7 and 8) the claimed ranges showing the unsuitability of the samples which were produced outside of the claimed ranges and, thus, the criticality of these ranges. (page 25, line 12 - page 33, line 7). Applicants respectfully submit that the specification sets forth adequate evidence of the criticality of the claimed ranges and that this criticality is not taught or suggested in the applied reference. Applicants respectfully request withdrawal of this rejection and hereby rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed ranges.

Therefore, the Examiner is respectfully requested to withdraw this rejection of claims 14, 19-22, and 26-28.

G. The criticality of the "claimed ranges"

The Examiner agrees that a prima facie case of non-obviousness may be overcome by establishing criticality. However, the Examiner asserts that the claims are not commensurate in scope with the evidence supporting the claims.

In particular, the Office Action points out that acceptable samples were produced using temperatures ranging from 353 K to 403 K and that unacceptable samples were produced using temperature of 303 K and 333 K. The Office Action questions why 340 K is being asserted as the critical low-end cutoff point given these results and wonders how the Applicant knows that temperatures between 340 K to 353 K give the desired results. Given

these questions, the Office Action concludes that the showing of criticality is not commensurate in scope with the claims. Applicants respectfully submit that the results are commensurate in scope with the claims.

Applicants cannot be expected to conduct thousands of tests to determine an exact point at which unexpected results occur. Rather, Applicants conducted a reasonable number of tests and determined that a sample produced at a temperature of 333 K was unacceptable while a sample produced at a temperature of 353 K was acceptable. With this knowledge, Applicants picked a number between 333 K and 353 K within which it is known that a transition from unacceptable to acceptable results occur. The number picked was 340 K which Applicants respectfully submit is commensurate in scope to the range between 333 K and 353 K within which the transition occurs.

Indeed, the M.P.E.P. provides an example which supports this view. In section 716.02(d) the M.P.E.P. gives an example where tests demonstrated acceptable results occurred at 110 C and 130 C, while the prior art disclosed a temperature of 60 C. In that example, claim 8 recited a temperature of 100 C which is somewhere between the 110 C and 60 C range within which a transition from unacceptable to acceptable results occur. Applicants respectfully submit that as long as Applicants claim some point within a range where such a transition occurs, that such claim scope is commensurate in scope with the evidence offered to support the claim of criticality.

Further, the Examiner asserts that the evidence provided to support the criticality of the claimed range is not commensurate in scope because the evidence discloses samples: 1) which were produced by sputtering, while the claims recite any vacuum dry process; 2) include silver containing 5 % by weight of gold, while the claims recite any silver containing

films; and 3) which only include three layers, while the claims recite a combination of at least three layers.

The Applicants have explained that the type of vacuum dry process, the exact composition of the silver containing films and the number of layers are not relevant to the criticality of the claimed ranges as described by the present specification. Indeed, the type of vacuum dry process, the composition of the silver containing film and the number of layers are maintained constant across the sample to show the criticality of the claimed range of temperatures.

In response, the Examiner asserts that the claims are not "commensurate in scope" with the proffered evidence because the claim scope is clearly broader in aspects which are not relevant to the claimed range. Applicants respectfully submit that the Examiner is improperly extending the requirements of a showing of criticality as to a claimed range to other features of the claims.

The Examiner cites M.P.E.P. § 716.02(d) in support for this proposition. However, this section clearly relates only to the claimed range. "In other words, the showing of unexpected results must be reviewed to see if the results occur over the entire claimed range." (Id. emphasis added). This section continues to provide an example from *In re Clemens* 622 F. 2d 1029, 1036, which concerned claims directed to a process of removing corrosion. In that case, the Appellant demonstrated unexpected results via comparative tests within a specified temperature range without reference to other features of the invention.

Applicants also respectfully direct the Examiner's attention to M.P.E.P. § 2144.05(III) which directly addresses this issue. That section recites "Applicants can rebut a *prima facie* of obviousness based on overlapping ranges by showing the criticality of the claimed range. .

. In such a situation, the applicant must shown that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." (Emphasis added).

Clearly, the Applicant has not asserted that the type of vacuum dry process, the particular silver composition nor the number of layers is critical. Rather, Applicants are asserting that the claimed range of temperatures is critical. Applicants respectfully submit that the evidence provided by the present specification clearly demonstrate the criticality of the claimed range.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that claims 13-28, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

However, should the Examiner continue to refuse to allow the claims based upon the allegations which have been submitted, the Applicants will be forced to remove this Application from the Examiner's hands and appeal this Application to the Board of Patent Appeals and Interferences.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 11/26/03

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CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that the foregoing Request for Reconsideration under 37 C.F.R. §1.116 was filed by facsimile with the United States Patent and Trademark Office, Examiner Wesley D. Markham, Group Art Unit # 1762 at fax number 703-872-9311 this 26th day of November, 2003.

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